AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

LISTING OF CLAIMS:

Claims 1-4 (cancelled).

Claim 5 (currently amended). A process for the preparation of canthaxanthin wherein the ~~said~~ process comprises culturing a recombinant cell containing farnesyl pyrophosphate and isopentyl pyrophosphate under culture conditions sufficient for the expression of enzymes which catalyze the conversion of the farnesyl pyrophosphate and isopentyl pyrophosphate to canthaxanthin, the ~~said~~ recombinant cell being a host cell transformed by an expression vector comprising a regulatory sequence and a polynucleotide containing the following DNA sequences which encode the ~~said~~ enzymes:

a) a DNA sequence which encodes the geranylgeranyl pyrophosphate (GGPP) synthase of *Flavobacterium sp.* R1534 (crtE) (SEQ ID NO: 2) or a DNA sequence that hybridizes to a complementary strand of SEQ ID NO: 1 under the following conditions: hybridization in 7% sodium dodecyl sulfate (SDS), 1% bovine serum albumin (BSA), 0.5 M Na_2HPO_4, pH 7.2, at 65°C, washing twice for 5 minutes each in 2X SSC, 1% SDS, at room temperature, followed by two additional washes for 15 minutes each in 0.1% SSC, 0.1% SDS, at 65°C, wherein the hybrid DNA encodes a polypeptide having geranylgeranyl pyrophosphate (GGPP) synthase activity ~~which is substantially homologous~~,

b) a DNA sequence which encodes the prephytoene synthase of *Flavobacterium sp.* R1534 (crtB) (SEQ ID NO: 3) or a DNA sequence that hybridizes to SEQ ID NO: 1 under the following conditions: hybridization in 7% sodium dodecyl sulfate (SDS), 1% bovine serum albumin (BSA), 0.5 M Na_2HPO_4, pH 7.2, at 65°C, washing twice for 5 minutes each in 2X SSC, 1% SDS, at room temperature, followed by two additional washes for 15 minutes each in 0.1% SSC, 0.1% SDS, at 65°C, wherein the hybrid DNA encodes a polypeptide having prephytoene synthase activity ~~which is substantially homologous~~,

c) a DNA sequence which encodes the phytoene desaturase of *Flavobacterium sp.* R1534 (crtI) (SEQ ID NO: 4) or a DNA sequence that hybridizes to SEQ ID NO: 1 under the following conditions: hybridization in 7% sodium dodecyl sulfate (SDS), 1% bovine serum albumin (BSA), 0.5 M Na_2HPO_4, pH 7.2, at 65°C, washing twice for 5 minutes each in 2X SSC, 1% SDS, at room temperature, followed by two additional washes for 15 minutes each in 0.1% SSC, 0.1% SDS, at 65°C, wherein the hybrid DNA encodes a polypeptide having phytoene desaturase activity ~~which is substantially homologous~~,

d) a DNA sequence which encodes the lycopene cyclase of *Flavobacterium sp.* R1534 (crtY) (SEQ ID NO: 5) or a DNA sequence that hybridizes to SEQ ID NO: 1 under the following conditions: hybridization in 7% sodium dodecyl sulfate (SDS), 1% bovine serum albumin (BSA), 0.5 M Na_2HPO_4,

pH 7.2, at 65°C, washing twice for 5 minutes each in 2X SSC, 1% SDS, at room temperature, followed by two additional washes for 15 minutes each in 0.1% SSC, 0.1% SDS, at 65°C, wherein the hybrid DNA encodes a polypeptide having lycopene cyclase activity ~~which is substantially homologous~~, and

e) a DNA sequence which encodes the β-carotene β4-oxygenase of microorganism E-396 ($crtW_{E396}$) (SEQ ID NO: 32) ~~or a DNA sequence which is substantially homologous~~;

and isolating the canthaxanthin from such cells or the culture medium.

Claim 6 (currently amended). A ~~The~~ process according to ~~of~~ claim 5 wherein the ~~said~~ DNA sequences are:

(a) the ~~a~~ DNA sequence which encodes the GGPP synthase of *Flavobacterium sp.* R1534 (crtE) (SEQ ID NO: 2),

(b) the ~~a~~ DNA sequence which encodes the prephytoene synthase of *Flavobacterium sp.* R1534 (crtB) (SEQ ID NO: 3),

(c) the ~~a~~ DNA sequence which encodes the phytoene desaturase of *Flavobacterium sp.* R1534 (crtI) (SEQ ID NO: 4),

(d) the ~~a~~ DNA sequence which encodes the lycopene cyclase of *Flavobacterium sp.* R1534 (crtY) (SEQ ID NO: 5), and

(e) the ~~a~~ DNA sequence which encodes the β-carotene β4-oxygenase of microorganism E-396 ($crtW_{E396}$) (SEQ ID NO: 32).

Claim 7 (cancelled).

Claim 8 (currently amended). The process of claim 6 ~~7~~ wherein:

(a) the DNA sequence encoding the GGPP synthase comprises nucleotides ~~bases~~ 2521-3408 of SEQ ID NO: 1 ~~Figure 7~~,

(b) the DNA sequence encoding the prephytoene synthase comprises the complement of nucleotides ~~bases~~ 3405-4316-~~3405~~ of SEQ ID NO: 1 ~~Figure 7~~,

(c) the DNA sequence encoding the phytoene desaturase comprises the complement of nucleotides ~~bases~~ 4313-5797 of SEQ ID NO: 1 ~~Figure 7~~,

(d) the DNA sequence encoding the lycopene cyclase comprises the complement of nucleotides ~~bases~~ 5794-6942 of SEQ ID NO: 1 ~~Figure 7~~, and

(e) the DNA sequence encoding the β-carotene β4-oxygenase comprises the sequence of SEQ ID NO: 31 ~~Figure 31~~.

Claims 9-19 (cancelled).